

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of

Docket No: Q83823

Johan RANSQUIN, et al.

Appln. No.: 10/510,183

Group Art Unit: 1795

Confirmation No.: 6804

Examiner: Golam Mowla

Filed: September 30, 2004

For: CONCENTRATION SOLAR BATTERY PROTECTED AGAINST HEATING

**REPLY BRIEF UNDER 37 C.F.R. § 41.41**

**MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.41, and responsive to the Examiner's

Answer mailed July 8, 2010, Appellant submits the following:

**I. REAL PARTY IN INTEREST**

The real party in interest is Thales, the assignee (although as yet unrecorded at the USPTO) of the application.

**II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

### **III. STATUS OF CLAIMS**

Claims 1-7 are all of the claims pending in the application.

Claims 1, 4 and 7 are rejected under 35 USC 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Horne et al (USP 5,611,870).

Claims 2 and 3<sup>1</sup> are rejected under 35 USC 103(a) as being unpatentable over AAPA in view of Horne et al, and further in view of Chappell et al (USP 4,300,472).

Claims 5 and 6 are objected to but would be allowable if rewritten in independent form.<sup>2</sup>

Claims 1-4 and 7 are appealed.

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<sup>1</sup> In the final Office action mailed March 19, 2009, claim 3 was rejected as unpatentable over AAPA in view of Horne et al, without reliance on Chappell, and the rejection additionally relying on Chappell is a new ground of rejection stated for the first time in the Examiner's Answer mailed July 8, 2010. Appellant responds to this ground of rejection in accordance with 37 CFR 41.39(b).

<sup>2</sup> See Notice of Panel Decision from Pre-Appeal Brief Review mailed October 27, 2009.

**IV. STATUS OF AMENDMENTS**

There were no amendments submitted subsequent to the final Office action mailed March 19, 2009.

**V. SUMMARY OF THE CLAIMED SUBJECT MATTER**

See Appeal Brief filed April 27, 2010.

**VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The grounds of rejection to be reviewed on appeal are:

1. Whether claims 1, 4 and 7 are unpatentable over AAPA in view of Horne et al; and
2. Whether claims 2 and 3 are unpatentable over AAPA in view of Horne et al, and further in view of Chappell et al;

## **VII. ARGUMENT**

### **1. Claims 1, 4 and 7 Are Not Unpatentable Over AAPA In View of Horne et al**

The applicant admitted prior art (AAPA) is shown in Fig. 1 of the present application. The photocell 101 is covered by a protective layer 102 designed to pass “wanted” radiation (i.e., radiation that is suitable for photoelectric conversion by the photocell) to the photocell 101, while reflecting “unwanted” radiation (i.e., radiation that would not be converted by the photocell) away from the photocell. This prevents the photocell from being needlessly heated by radiation that serves no photoelectric purpose.

To increase the output of the photocell 101, a reflecting concentrator 106 adjacent the photocell reflects additional radiation toward the photocell.

Fig. 36 of Horne et al shows a photovoltaic cell 174. Radiation passes through a filter array 172, then through a concentrating prism and then strikes the photocell 174.

The examiner argues that it would have been obvious in view of Horne et al to place a filter layer such as 172 of Horne et al over the reflecting concentrator 106 in the AAPA. However, there is no reason to do this absent hindsight after reviewing the present application. There are two reasons that would teach strongly against such a modification. First, the AAPA already includes a reflecting filtering layer 102 that is placed in a position where it will intercept all light passing toward the photocell, and that reflects unwanted radiation away from the photocell. Horne et al similarly places the filter layer 172 in a position such that no light can reach the photocell 174 without passing through the filter layer 172, so that the reflecting filtering layer 172 can reflect unwanted radiation away from the photocell. In each case, a single reflecting filter layer is used, and in a place where it intercepts all light passing to the photocell. There is no reason to use a second filtering layer in the AAPA, because the filtering layer 102 is already in a position where it intercepts all of the light that could otherwise reach the photocell.

Another way that the artisan would see the prior art is that placing the filtering layer over the concentrating prism in Horne et al makes sense because the prism is placed over the



photocell and the filtering layer is easier placed on top of the prism, but placing the filtering layer over the reflecting concentrator 106 in the AAPA would not be acceptable because it would not intercept light passing directly to the photocell without striking the reflecting concentrator 106. On the other hand, the only place in the AAPA that would make sense for the filter would be directly over the photocell 101, but the AAPA already has a filtering layer 102 in that position. Thus, there is no need to make any change to the filtering layer in the AAPA.

There is nothing in either reference that suggests it would be advantage to add a second filtering layer over the reflector 106 when the AAPA already includes a layer 102 that will eventually intercept any radiation directed to the photocell from the reflector 106. There is no suggestion that the layer 102 is inadequate, and no reason given for adding a redundant and apparently superfluous filter.

A second reason which would have led the artisan away from the modification proposed by the examiner is that, even aside from the redundancy issue discussed above, a reflecting filtering layer over the reflector 106 in the AAPA would not have seemed practical. More particularly, the AAPA uses the reflecting concentrator to reflect light toward the photocell. A reflecting filtering layer placed in the same position as the reflector 106 and covering the reflector 106 would reflect radiation toward the photocell. But any radiation reflected toward the photocell by a reflecting filtering layer over the reflector 106 would be unwanted radiation. This would make no sense. This is explained in the paragraph at the bottom of page 9 of the Appeal Brief, and the Examiner does not address this problem in the Examiner's Answer.

If one is to place a filtering layer over the reflector 106 in Fig. 1 of the present application, the present application teaches two design options to make it practical: (1) make it an *absorptive* filtering layer as is the case in Fig. 3 of the present application, or (2) if using a filter which *reflects* unwanted radiation, have the surface of the reflecting filter layer angled so that the reflected unwanted radiation is not reflected toward the photocell, as is the case in Fig. 3 of the present application. In this latter case, however, it is necessary to arrange the angle of the reflecting concentrator 106 such that in combination with the refractive index of the filter

material the wanted radiation will be refracted (207), reflected (217) and refracted (208) and end up being directed toward the photocell 101.

There is nothing in Horne et al to suggest any of this. All Horne et al teaches in Fig. 36 is a filter layer that reflects unwanted radiation. Thus, without the benefit of the teaching of the present application, the artisan would have seen that the reflecting concentrator of Horne et al (a) is unnecessary and (b) would not work if placed over the reflector 106 of the AAPA. The fact of the matter is that, without benefit of the teaching of the present application, the modification proposed by the examiner would simply make no sense.

For the above reasons and as already explained in the Appeal Brief, the subject matter of claim 1 would not have been obvious to one of ordinary skill in the art from the teachings of AAPA and Horne et al. Claims 4 and 7 are allowable due to their dependence on claim 1.

As to claim 4 separately, it recites that the filter (recited in claim 1 as being placed over the reflecting surface of the concentrator) has an exterior face oriented to divert the unwanted radiation away from the photoelectric cell. As discussed above, the purpose of the layer 106 in AAPA is to reflect radiation toward the photoelectric cell, and it is oriented at an angle to do that. The reflecting filter layer 172 of Horne et al is of constant thickness, so placing the layer 172 on top of the reflector 106 will result in the reflecting surface of the filter layer 172 being disposed at an angle such that any radiation reflected will be reflected toward the photoelectric cell 101. Thus, placing the layer 172 of Horne et al over the reflector 106 of AAPA would not result in what is recited in claim 4.

It is not intuitive to place a reflecting filter over a member whose function is to reflect radiation toward the photocell. Yet the examiner proposes that it would have been obvious to do this seemingly non-sensical thing and then maintains that he is not relying on hindsight.

Appellant submits that the proposed combination can only be based on hindsight, since it makes no sense otherwise, until one sees how and to what purpose it is done in the present application.

**2. Claims 2 And 3 Are Not Unpatentable Over AAPA In View of Horne et al, And Further In View of Chappell et al**

Finally, as to claims 2 and 3 separately from their allowability due to dependence on claim 1, claim 2 recites that the filter layer over the reflecting concentrator is an absorptive layer. Appellant does not claim to have invented absorptive filter layers, so it is not contested that such layers are taught in the prior art, including Chappell. But in supporting a case for obviousness, *without the benefit of hindsight*, one must examine just what it is that the artisan would have seen. The AAPA teaches a reflecting filter layer 102 over the photoelectric cell 101, at a location where it intercepts all light directed to the photoelectric cell 101 and where it can reflect unwanted radiation away from the photoelectric cell. Horne et al similarly teaches a reflecting filter layer 172 at a location where it intercepts all light directed to the photoelectric cell 172 and where it can reflect unwanted radiation away from the photoelectric cell. *Without benefit of the teaching of the present application*, where would the artisan have started? Looking at AAPA and Horne et al, the artisan would simply have seen that the two systems are designed differently but that the reflecting filter layers 102 and 172 perform similar functions in their respective systems and there is no need to duplicate them. That would have been the end of the analysis.

Further, as to modifying Horne et al to adopt an absorptive filter of Chappell, it must be kept in mind that Fig. 36 is one figure of many in Horne et al, with the central point of Horne et al being in its novel and effective reflecting filter structure. Fig. 36 is simply one example of a

suitable application for the inventive filter structure of Horne et al. It would have run directly contrary to the teaching of Horne et al to scrap its reflective filter structure, the heart of its invention, in favor of a completely different filter.

In addition, an absorptive filter will generate more heat than a reflective filter, since the absorption of the radiation will require dissipation of the energy of the radiation. This increased heat is not acceptable for the layer 102 of AAPA which is disposed directly on the photoelectric cell 101, since heating of the photoelectric cell is undesirable. It is similarly not acceptable in the arrangement of Fig. 6 of Horne et al since the concentrating prism is disposed directly on the photoelectric cell. So it would not have been obvious to change either the layer 102 of AAPA or the layer 172 of Horne et al to an absorptive filter layer. The use of an absorptive filter layer only becomes acceptable at a location physically apart from the photoelectric cell. Neither of AAPA or Horne et al teach such a filter layer disposed at a location physically separate from the photoelectric cell.

So the artisan would have had to (1) decide to add a second filtering layer to AAPA when none of the prior art teaches a second filtering layer, only one layer, (2) place the second filtering layer at a location physically remote from the photoelectric cell and at a location where it will not intercept all radiation passing to the photoelectric cell, which is not taught by either of AAPA or Horne et al, and (3) after having decided on the counterintuitive steps of (1) and (2), decide that the new filtering layer to be added should be an absorptive filter. It is respectfully submitted that this sequence of decisions would not have resulted from the artisan simply reviewing the prior art.

**Conclusion –**

The present invention is a system made up of multiple interactive parts. There is a photoelectric cell, a protective layer over the photoelectric cell, a reflector whose function is to reflect light toward the surface of the protective layer of the photoelectric cell, and a filtering layer over the reflecting concentrator. The various components all work together to achieve a desired result. Of particular and non-obvious import is the filtering layer over the reflecting concentrator. A layer at a location in the optical system where it would make no sense to reflect toward the photocell 101, yet a layer covering a component whose function is just that, i.e., to reflect light toward the photocell. The present inventors have (a) recognized the need for the second filter layer (as explained in the background discussion of the present application), a need not recognized anywhere in the prior art which consistently teaches the use of a single, optimally placed filtering layer, and (b) addressed the problem of having a reflecting filtering layer reflect unwanted light toward the photocell by either making the filter layer absorptive or arranging it so that its reflective surface is not parallel to the reflecting surface 106 of the concentrator. The prior art does not recognize the need, does not recognize the solution to the need, does not recognize the problems that arise when one wants to place a filter over a component designed to reflect light toward the photocell, and does not propose or suggest solutions to those problems. By itself, the prior art simply does not lead one of skill in the art to what is claimed. Certainly, the prior art teaches elements which could be pieced together to achieve the claimed invention, but there is nothing to teach the artisan to combine the features in the manner proposed by the examiner.

Reply Brief  
U.S. Application No.: 10/510,183

Attorney Docket No.: Q83823

Reversal of the examiner is requested.

Respectfully submitted,

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WASHINGTON OFFICE

**23373**

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Date: September 8, 2010

**CLAIMS APPENDIX**

CLAIMS 1-4 AND 7 ON APPEAL:

1. A concentrator photovoltaic generator, comprising at least one photoelectric cell covered by a transparent protection layer and further comprising a reflecting concentrator for directing luminous flux toward said photoelectric cell, said concentrator having a reflecting surface for reflecting incident radiation, characterized in that the reflecting surface of said concentrator is covered by a filter such that incident radiation must pass through said filter to reach said reflecting surface in order to be reflected, and after reflection by said reflecting surface must pass again through said filter in order to be directed toward said photoelectric cell, said filter eliminating in the luminous flux directed by the concentrator toward the photoelectric cell most of the "unwanted" radiation that is not able to excite the photoelectric cell.

2. A generator according to claim 1, characterized in that the filter is formed of a filter layer made from materials absorbing the "unwanted" portion of the radiation.

3. A generator according to claim 2, characterized in that the filter layer is of constant thickness.

4. A generator according to claim 1, characterized in that the filter is formed of a filter layer whose exterior face is oriented to divert this "unwanted" radiation away from the photoelectric cell.

7. A generator according to claim 1, wherein said filter is formed of a material reflecting the “unwanted” portion of the radiation.



**EVIDENCE APPENDIX:**

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by Appellant in the appeal.

**RELATED PROCEEDINGS APPENDIX**

There are no decisions rendered by a court or the Board in any proceeding identified about in Section II pursuant to 37 C.F.R. § 41.37(c)(1)(ii).